



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D350-748-101
Job Sheet 174638



Part No: D350-748-101

Job Qty: 1 ea

Part Name: FWD Crosstube AS350 / AS355



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 3/20/18

Job Tracking No:

Due Date: 7/20/18

Created By: Marie Lajeunesse

Type: SOLD

Description:

Note: DWG REV H IPP Rev:A New Issue 06-07-05 JLM IPP Rev:B Update qty of MS21042L5 06-09-12 KJ VERIFY BY:DD IPP Rev:C Rev B 07-11-15 DD IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F 10.08.04 added QSI010 4.3 DD verf:EC IPP REV:G ADD UNDER BEND COMMENT 12-05-28 JLM IPP REV:H 12.11.05 as per dwg D350-748-141G DD verf:JLM IPP REV:I 15.03.19 as per dwg D350-748-141revH dd verf:jlm

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	7/19/18	7/19/18	0.00	0.00	Start Up Crosstubes-1		DPL 18-07-29
110	CNC Bend Skidtubes	1 pcs	7/19/18	7/19/18	0.00	2.86	CNC Bend Skidtube		DPL 18-07-19
120	Crosstubes	1 pcs	7/19/18	7/19/18	0.00	1.94	Crosstubes-2		DPL 18-07-19
125	Outsource	1 pcs	7/19/18	7/19/18	0.00	0.00	Outsource1	P/O:040554	02/18/07/19
126	Packaging	1 pcs	7/19/18	7/19/18	0.00	0.00	Packaging2		18.07.23
127	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC15		18.07.24
128	Crosstubes	1 pcs	7/19/18	7/19/18	0.00	1.94	Crosstubes-2		18-07-25
130	Crosstubes	1 pcs	7/19/18	7/19/18	0.00	1.94	Crosstubes-2		18-07-25
140	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC5		38
150	Outsource	1 pcs	7/19/18	7/19/18	0.00	0.00	Outsource3		18-07-27
160	Packaging	1 pcs	7/19/18	7/19/18	0.00	0.00	Packaging2		AUG 15 2018
170	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC6		18.08.16
174	Outsource	1 pcs	7/19/18	7/19/18	0.00	0.00	Outsource2		
176	Packaging	1 pcs	7/19/18	7/19/18	0.00	0.00	Packaging2		AUG 21 2018
178	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC5		38
180	SprayPaint	1 pcs	7/19/18	7/19/18	0.00	0.97	Spray Paint		9-89
190	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC14		18-8-23
200	Crosstubes	1 pcs	7/20/18	7/20/18	0.00	1.94	Crosstubes-2		AUG 30 2018
210	QC	1 pcs	7/20/18	7/20/18	0.00	0.00	QC5		38
220	Packaging	1 pcs	7/20/18	7/20/18	0.00	0.00	Packaging1-3		9-89
230	QC	1 pcs	7/20/18	7/20/18	0.00	0.00	QC4		DAS
235	DC	1 pcs	7/20/18	7/20/18	0.00	0.00	DC		21
240	Packaging	1 pcs	7/20/18	7/20/18	0.00	0.00	Packaging3-1		9-89
250	QC21-FG	1 Ea	7/20/18	7/20/18	0.00	0.00	QC21		DAS

Part Op 110 - Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT *****UNDER
Descriptions: BEND .225" PER SIDE*****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS*****

120 - *****VERIFY CROSSTUBE DIMENSIONS AS PER DWG*****

125 - ISSUE P/O TO METCOR: *****Stress relief*** Heat treat crosstube as per QSI010 4.3 within 12h after bending

127 - *****MARK CUT LINES*****

128 - CUT TUBE AT HEIGHT ON FAI SHEET VERF HEIGHT _____ BY QC 15 LEVEL INSPECTOR _____

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION		AGAINST DEPARTMENT/PROCESS			
	Rework ☐	Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	
	Scrap ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	
	Use-as-is ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	
	Suspected Unapproved ☐	Large Fab ☐	Composite ☐	Supplier ☐		

Date : _____	Step #: _____	QTY Effective : _____	MRB (QSI042) Approval
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Description Work Order Deviation	Disposition	Completed By
		Lead hand / Supervisor Approval Verification
		QC / QA Coordinator Approval

Root Cause			FAULT CATEGORY		
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐
Past Expiry Date ☐	Manufacturing Process ☐				
Misidentified ☐	Past Due ☐	OTHER : _____			

VERF TWIST 0.0 BY QC15 LEVEL INSPECTOR

130 - 2- Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs, Set-up drill table as per QSI 010 3- Deburr
4- Engrave Part # and Batch # as per Dwg D350-748-141 5- Remove all marks from tube within limits of D350-748-141 6-
Apply a light coat of LPS3 on the interior of tube Batch:

140 - CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)

150 - Issue P/O: 040630 Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadum
Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possible Supplier:
Southwest United Industries Ensure Certificate of Conformity is attached

160 - Ensure certificate of conformity is attached

174 - ISSUE P/O TO ACUREN: 040752

0.03 AUG 17 2018

180 - 1-Prime inside and out crosstube as per QSI 005 4.2 2-Paint Outside of Tube as per Dart QSI 005 4.2

190 - Then, Wrap in plastic bag to protect from scratches

200 - INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER 2-Install supports with Proseal 890 per
D350-748-141 and QSI 015 EXP 138548, 11/18 3-Install supports clamps Using Dt8876 as per Dwg D350-748-
141, Torque to 60-80 IN-LBS. ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS
AS PER DWG.***

235 - Photocopy bluefile & type labels per PPPD350-748-101 CHG003

240 - Identify and pack for shipping as per PPP D350-748-101

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D350-748-141TRN	Crosstube Turning Detail	1 Ea (1 ea)	90-Start up Operation	
ALS4-1032-225	Rivnut	1 Ea (1 ea)	200-Crosstubes	
D3502-1	Support	2 Ea (2 ea)	200-Crosstubes	
D5123-7	Clamp Cushion	2 Ea (2 ea)	200-Crosstubes	
MS21920-20	Clamp	2 Ea (2 ea)	200-Crosstubes	
MS27039-1-10	Screw	1 Ea (1 ea)	200-Crosstubes	
NAS1149D0363J	Washer	1 Ea (1 ea)	200-Crosstubes	
AN4-41A	Bolt	8 Ea (8 ea)	220-Packaging	
AN4-6A	Bolt	16 Ea (16 ea)	220-Packaging	
AN5-32A	Bolt	4 Ea (4 ea)	220-Packaging	
D3500-1	Saddle	4 Ea (4 ea)	220-Packaging	
D3501-1	Bushing	16 Ea (16 ea)	220-Packaging	
MS21042L4	Nut	24 Ea (24 ea)	220-Packaging	
MS21042L5	Nut	4 Ea (4 ea)	220-Packaging	
NAS1149D0463J	Washer	32 Ea (32 ea)	220-Packaging	
NAS1149D0563J	Washer	8 Ea (8 ea)	220-Packaging	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D350-748-141TRN	1	0	0
200-Crosstubes	ALS4-1032-225 <u>FMI3C579</u>	①	1,149	0
	D3502-1 <u>163478</u>	②	62	0
	D5123-7 <u>F15323C</u>	②	145	0
	MS21920-20 <u>5024478</u>	②	108	0
	MS27039-1-10 <u>5071834</u>	①	313	0
	NAS1149D0363J <u>5068661</u>	①	3,131	0
220-Packaging	AN4-41A	8	230	0
	AN4-6A	16	620	0
	AN5-32A	4	114	0
	D3500-1	4	101	0
	D3501-1	16	99	0
	MS21042L4	24	2,466	0
	MS21042L5	4	722	0
	NAS1149D0463J	32	3,386	0
	NAS1149D0563J	8	2,107	0

DART
AEROSPACE

Container No: **S093535**



Part: **D350-748-101**

Job No: **174638**

Serial No/Batch: **S093535**

Revision:

Inspector:

Exp Date:

Instructions:

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL: 1 813 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

ifications

ld not be found.

Plex 3/20/18 10:42 AM Dart.lajeunesse.marie

Date: 07/18/18

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

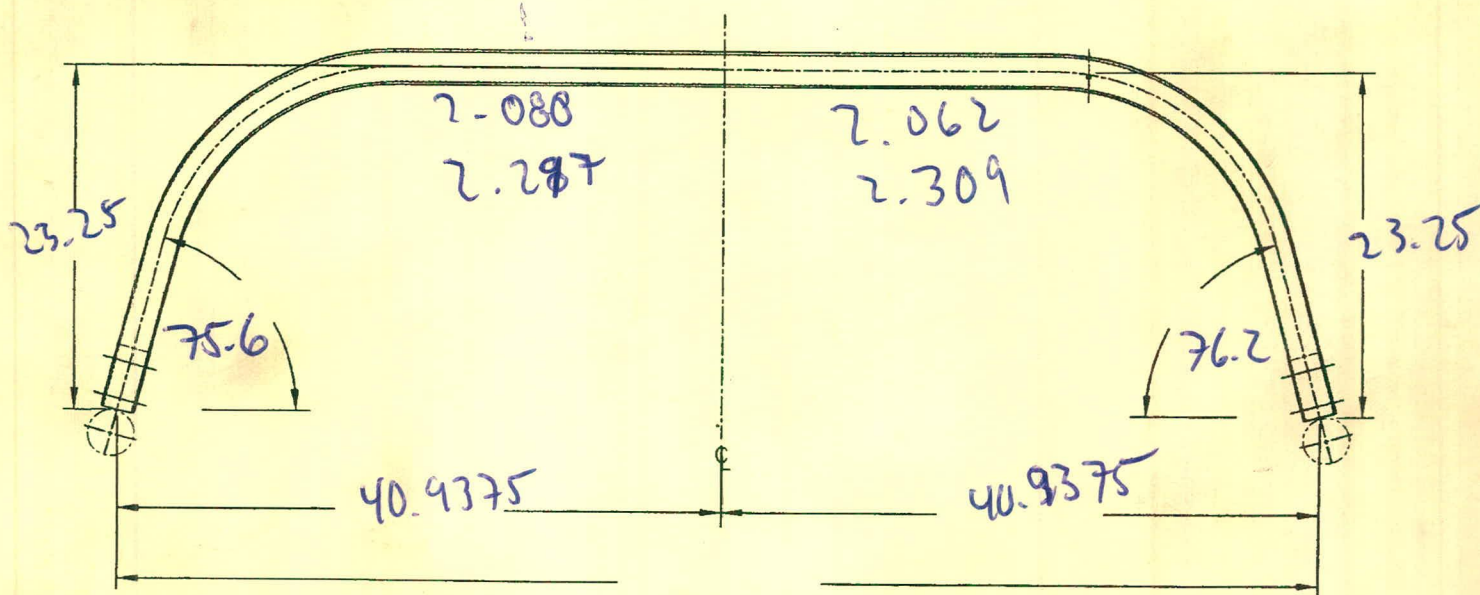
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

DART AEROSPACE LTD		Work Order: 174638	
Description: Crosstube High Fwd (AS350/355)		Part Number: D350-748-101	
Inspection Dwg: D350-748-141 Rev: H		Page 1 of 1	

Required Dimension	Min	Max
Height	23.00	23.50
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.55	82.05
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes	38	38
Crushing	4.9%	5.6%
Comments		

QC15 Inspection	18.07.24
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing & twist dimensions	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	
G	14.11.10	Height dimension revised	KJ	
H	15.04.14	Dwg Rev updated	KJ	
I	15.09.09	Crushing dimension revised	KJ	

Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D5123-7	CLAMP CUSHION
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (OR MS21920-21/-22, PER DART SPEC. M-MS21920-20/-21/-22)
8	1	MS27039-1-10	SCREW
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH AFTER TURNING = 112.270 ± 0.06 (AFTER BENDING/TRIMMING = 110.27 REF)
- FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCE: PER DART QSI 018 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART QSI 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- WEIGHT: 30.45 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.

TURNING

- BLENDE OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS2759/1E AFTER TURNING. ACCEPTABLE TO VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.

BENDING

- ALL DIMENSIONS FOR BENT TUBE ARE POST STRESS RELIEF
- BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
- MAX AMPLITUDE OF RIPPING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
- AFTER BENDING, STRESS RELIEVE TUBE AT 650°F $\pm 0.25^\circ\text{F}$ FOR A MINIMUM OF 2 HRS AND ALLOW TO COOL TO AMBIENT TEMPERATURE (REF AMS2759/1E).
- MAX TWIST AFTER STRESS RELIEF: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (ZN C1-3).

ASSEMBLY

- TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- TORQUE CLAMPS 60 TO 80 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

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WORK ORDER

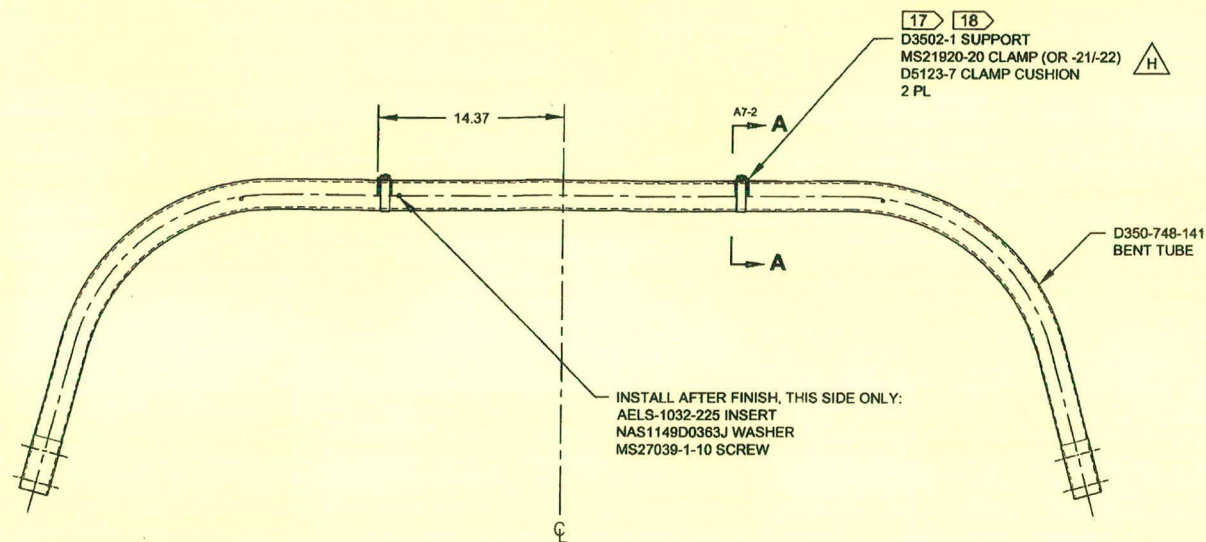
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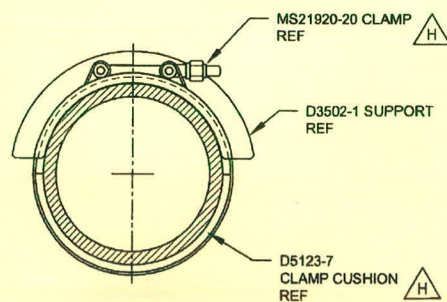
2015 MAR 18

9 EN 15-597

H	D5123-7 WAS D3595-063-395, MS21920-20 WAS -22, ALLOWABLE CRUSHING NOW 8% WAS 7%	CP	15.02.25
G	RMV ABRASION STRIP, SUPPORT NOW W/ PROSEAL & CUSHION, ADD STRESS RELIEF, LONGER CUFF, NOW TRIM'D AFTER BEND, ADD WALL DIMS & UPDATE TOL.	CP	12.09.12
F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	9	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	9		
CHECKED	ASS	DRAWING NO.	REV. H
MFG. APPR.	9	D350-748-141	SHEET 1 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	15.02.25	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



**D350-748-141
ASSEMBLY DETAIL**

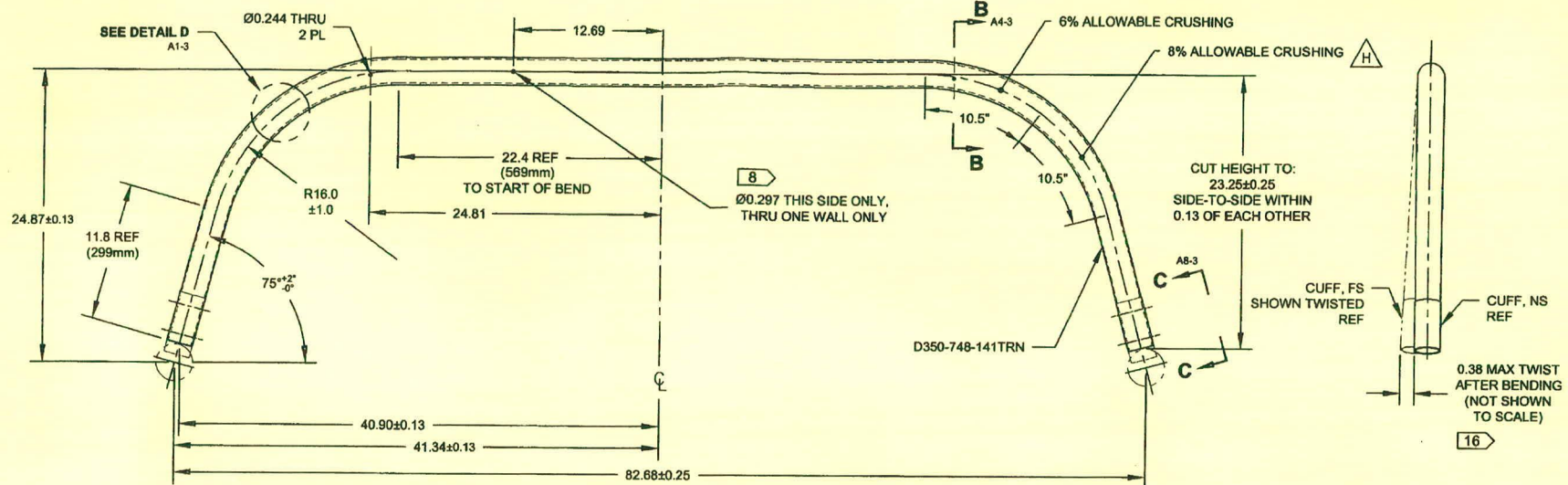


SECTION A-A D4-2
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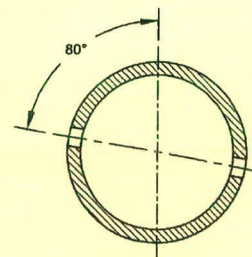
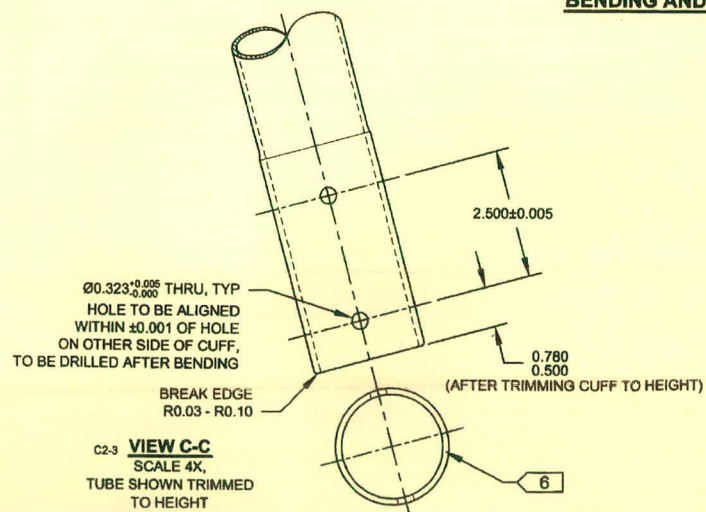
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2015 MAR 18

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DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ASS	DRAWING NO.	REV. H
MFG. APPR.		D350-748-141	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
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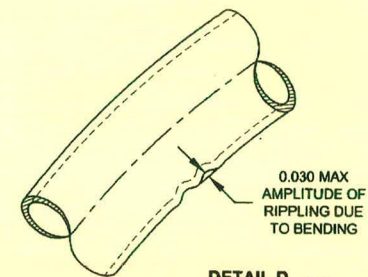
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BENDING AND DRILLING DETAIL 13



SECTION B-B D3-3
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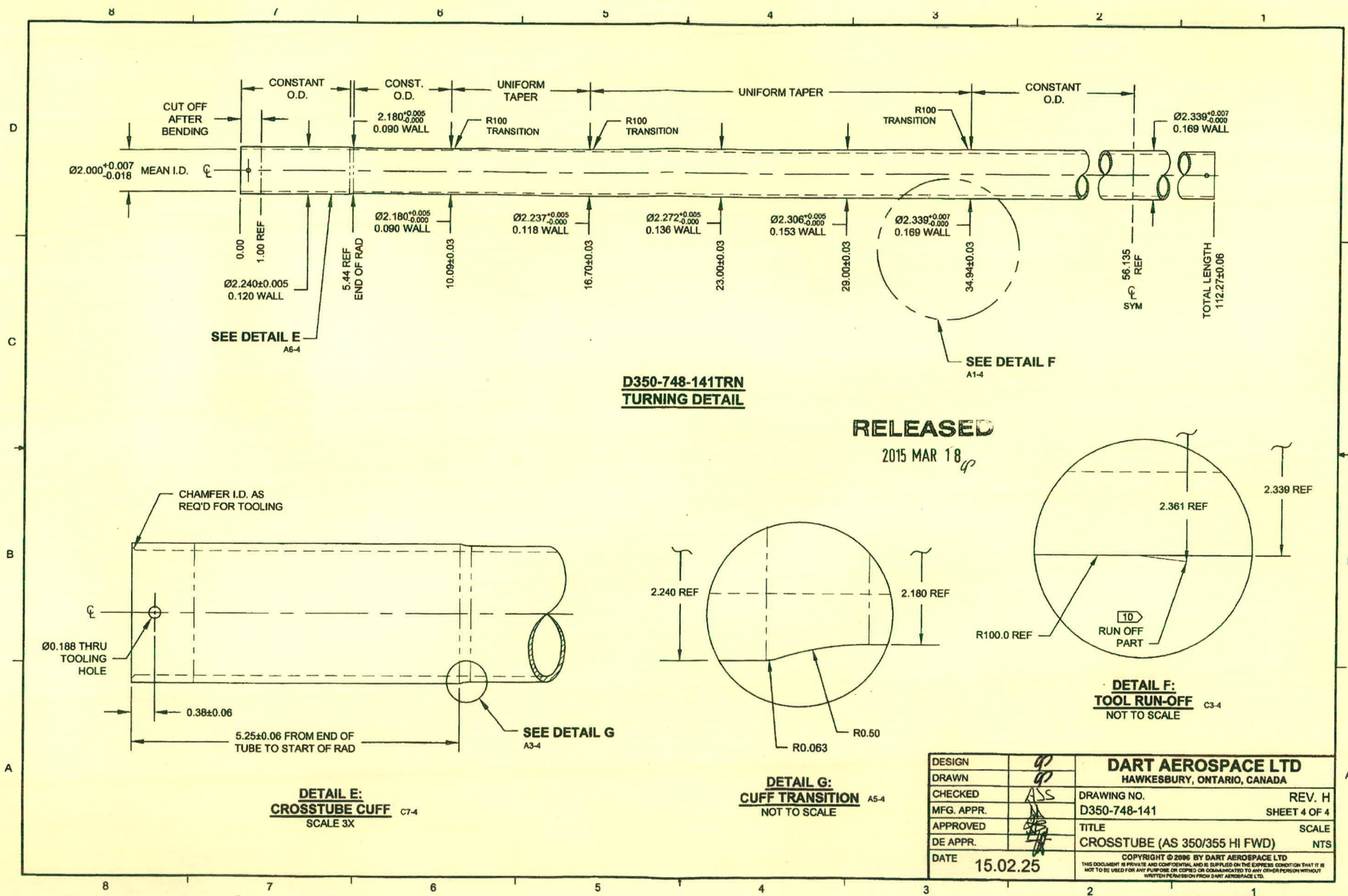
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2015 MAR 18



DETAIL D D7-3
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RIPPING EXAGGERATED

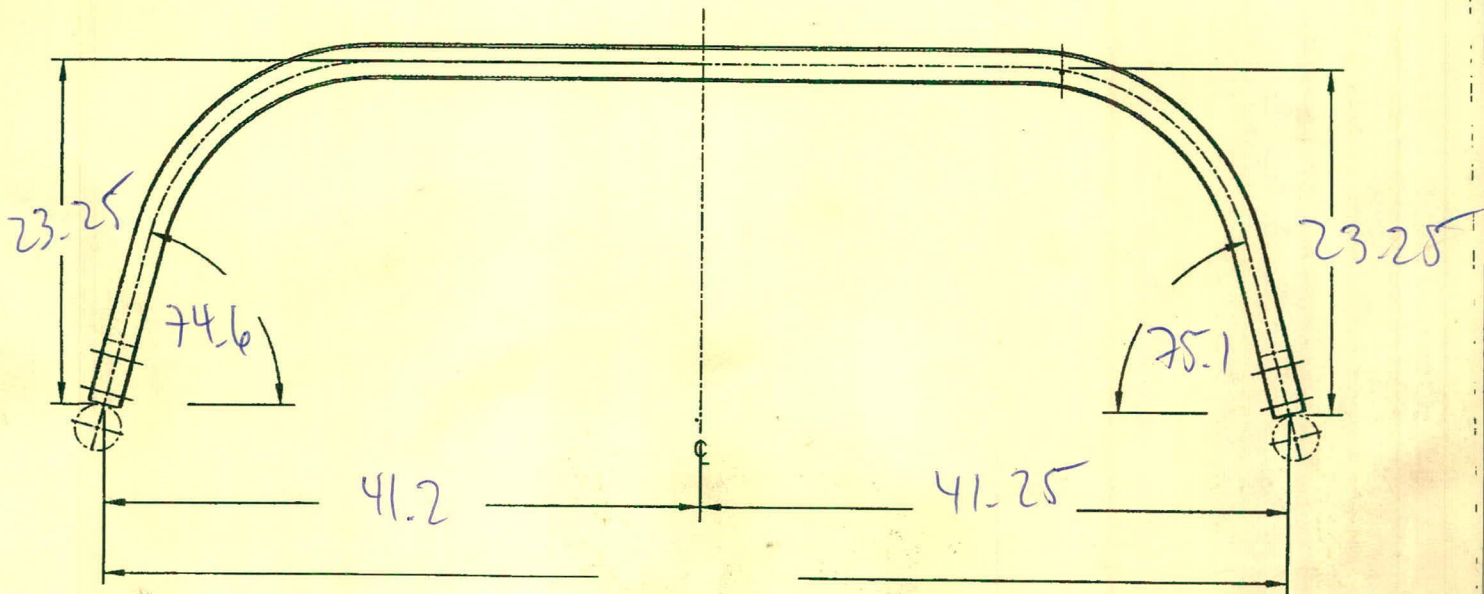
DESIGN	40	DART AEROSPACE LTD	
DRAWN	40	HAWKESBURY, ONTARIO, CANADA	
CHECKED	AS	DRAWING NO.	REV. H
MFG. APPR.		D350-748-141	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	15.02.25	COPYRIGHT © 2006 BY DART AEROSPACE LTD	
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DESIGN	90	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	90		
CHECKED	ASS	DRAWING NO.	REV. H
MFG. APPR.		D350-748-141	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	15.02.25	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DART AEROSPACE LTD	Work Order:	
Description: Crosstube High Fwd (AS350/355)	Part Number:	D350-748-101
Inspection Dwg: D350-748-141 Rev: H		Page 1 of 1

Required Dimension	Min	Max
Height	23.00	23.50
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.55	82.05
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes		
Crushing		
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	10.08.23	Dwg Rev updated	KJ	
C	11.11.07	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing & twist dimensions	KJ	
E	13.02.27	Dwg Rev updated	KJ	
F	14.02.13	Crushing & twist dimensions revised	KJ	
G	14.11.10	Height dimension revised	KJ	
H	15.04.14	Dwg Rev updated	KJ	
I	15.09.09	Crushing dimension revised	KJ	

53.35

1.28

28.14

8.14

1.14



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO040554**

Supplier: MEI001-VC
Metcor Inc.
560 Boul. Arthur Sauve
Saint-Eustache
QC
J7R 5A8 Canada
Phone: 450 473 1884
Fax: 450 491 5498

PO No: PO040554

PO Date: 7/19/18

Due Date: 7/20/18

Purchase Order

Revision:

Revision Date:

Ship-To Contact: Lavoie, Chantal
clavoie@dartaero.com

E-MAILED

JUL 19 2018

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground

Pymt Terms: Net 30

Freight Terms:

Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	174618	D350-748-101	FWD Crosstube AS350 / AS355 ISSUE P/O TO METCOR: AFTER BENDING: STRESS RELIEF AT 650° F ± 25° F FOR A MINIMUM OF 2 HRS AIR COOL TO AMBIENT TEMPERATURE DETAIL C OF C REQUIRED	Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
Line Item Note note: crosstube made from 4130 seamless steel tube											
	181018			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	174619			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	174642			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	174644			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	174638			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	174639			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
	174643			Firmed	-	7/20/18	1 pcs	0 pcs	1 pcs	\$205.00/pcs	\$205.00
Sub Total:							8	0	8		\$1,640.00

Grand Total: \$1,640.00

Order Notes

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ
ST-EUSTACHE, QC J7R 5A8
Tel: 450-473-1884 / Fax: 450-491-5498

Reçu de livraison

Delivery Receipt

BON DE TRAVAIL Order	EXPÉDITEUR Shipper ID	BON D'EXPÉDITION Shipper
329231	1	129746

EXPÉDITION COMPLÈTE / Shipped Complete

CLIENT /Customer 215

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053



LIVRÉ À /Shipped To

DART AEROSPACE
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
Ph: 613-632-5200
Fax: 613-632-1053

COMMANDE DU CLIENT Customer PO	BON DE LIVRAISON DU CLIENT Customer Shipper No.	TYPE DE MATÉRIEL Material Type	DATE DE LA COMMANDE Order Date	TRANSPORTEUR Carrier
40554		Steel	2018/7/19	CLIENT

QUANTITÉ Quantity	No. PIÈCE / Part No.	NOM DE LA PIÈCE / Part Name	DESCRIPTION DE LA PIÈCE Part Description	POIDS Weight
----------------------	-------------------------	--------------------------------	---	-----------------

8 D350-748-101 240,
CROSSTUBE
(8) D350-748-101
JOB 174618,181018,174619,174642,174644,
174638,174639,174643

1 NIL

TYPE DE CONTENEUR Container Type	# DE CONTENEURS # Of Containers	COMMENTAIRES CONTENEUR Container Comments
NIL	1	

CERTIFICAT

EMPAQUETAGE Packing	
-------------------------------	--

QUANTITÉ EXPÉDIÉE / Quantity Shipped : 8

POIDS EXPÉDIÉ / Weight Shipped : 240,00

QUANTITÉ RESTANTE / Quantity Remaining : 0

POIDS RESTANT / Weight Remaining : 0,00

APPROUVÉ

CERTIFICAT

QUANTITÉ EXPÉDIÉE Quantity Shipped: 8

POIDS EXPÉDIÉ / Weight Shipped : 240,00

Signature:

Date:

EXPÉDIÉ LE / Shipped On :2018/07/20

METCOR INC.

560 BOUL. ARTHUR-SAUVÉ, ST-EUSTACHE, QC, J7R 5A8

Tél.: 450-473-1884

Télécopieur / Fax administration: 450-491-5498

Télécopieur / Fax production: 450 491-6454

Certificat de Conformité Certificate of Compliance

BON DE TRAVAIL order	CHARGEMENT load
329231	1

CLIENT / customer 215

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

LIVRÉ À / shipped to:

DART AEROSPACE

1270 ABERDEEN

HAWKESBURY

ON K8A 1K7

1

COMMANDE DU CLIENT customer po	CLASSIFICATION PIECE part classification	MATÉRIEL material	MAÎTRE D'OEUVRE prime contractor	PROGRAM
40554	N/A	Steel		

SPÉCIFICATIONS DU PROCÉDÉ

processing specifications

STRESS REL

SAE AMS 2759/1 REV.E

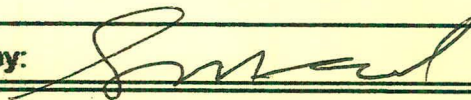
EXIGENCE / requirement	SPÉCIFICATIONS / specified	TESTS EXÉCUTÉS / performed	RÉSULTATS DE TESTS / results
Visual			

QUANTITÉ quantity	POIDS weight	DESCRIPTION DES PIÈCES parts description
8	240	D350-748-101 CROSSTUBE (8) D350-748-101 JOB 174618,181018,174619,174642,174644, 174638,174639,174643 1 NIL

28/7/18

COMMENTAIRES / comments

APPROUVÉ par / Approved by:



DATE: 2018-07-20



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO040630**

Supplier: CAD002-VC
Cadorath Coating
2150 Logan Ave.
Winnipeg
MB
R2R 0J2 Canada
Phone: 204 633 9420
Fax: 204 633 8033

PO No: PO040630
PO Date: 7/27/18
Due Date: 8/1/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Phone:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	174632	D350-748-101	FWD Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 Issue P/O: _____ Stress relief at 375degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 defree for 8 hrs, Chromate Treat C of C req'd	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
	181018	1 X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
DAS	174619	1 X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
9	174638	1 X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
9-89	174644	1 X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
Sub Total:							5	0	5		\$4,025.00

CT

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
2	174648	D350-748-201	Aft Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 Issue P/O: _____ Stress relief at 375degree for 5hrs Magnetic Particle Inspect per ASTM E1444 Cad Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375 defree for 8 hrs, Chromate Treat C of C req'd	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
	174675	/ X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
	174672	/ X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
	174649	/ X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
	174646	/ X	AUG 15 2018	Firmed	-	8/1/18	1 pcs	0 pcs	1 pcs	\$805.00/pcs	\$805.00
Sub Total:							5	0	5		\$4,025.00
										Grand Total:	\$8,050.00
Order Notes											
Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.											

Plex 7/27/18 11:42 AM dart.tsimiklis.chrisoula

Packing Slip



Cadorath Coating

2150 Logan Avenue, Winnipeg, Manitoba R2R-0J2

Phone: (204) 633-9420 Fax: (204) 633-8033

INVOICE NUMBER:

S96721

Net 2% Interest Per Month charged on Overdue Accounts.

Any claims for shortages, overcharges, or damaged goods must be made within seven (7) days from receipt of goods.

Sold To:

Dart Aerospace Ltd.
1270 Aberdeen St.

Hawksbury, ON K6A 1K7

ShipTo:

Customer Order #: PO040630
Date Received: Jul-31-2018

Terms: NET 30 DAYS

G.S.T. #: 10071 6547 RT0001

Ship Via:

Ship Date: Aug-03-2018

Item # Qty P/N & Description

2	1 EA	CROSSTUBE	S/N s093822
		P/N d350-748-101 ✓	W/O 185239 ✓
3	1 EA	CROSSTUBE	S/N s093613
		P/N d350-748-101 ✓	W/O 185240 ✓
4	1 EA	CROSSTUBE	S/N s093535
		P/N d350-748-101 ✓	W/O 185241 ✓ DAS 9 9-89
5	1 EA	CROSSTUBE	S/N s094950
		P/N d350-748-101 ✓	W/O 185242 ✓
6	1 EA	CROSSTUBE ✓	S/N s092710
		P/N D350-748-201	W/O 185243 ✓
7	1 EA	CROSSTUBE	S/N s092411
		P/N D350-748-201 ✓	W/O 185244 ✓
8	1 EA	CROSSTUBE	S/N s092564
		P/N D350-748-201 ✓	W/O 185245 ✓
9	1 EA	CROSSTUBE	S/N s092783
		P/N D350-748-201 ✓	W/O 185246 ✓
10	1 EA	CROSSTUBE	S/N s092689
		P/N D350-748-201 ✓	W/O 185247 ✓
1	1 EA	CROSSTUBE	S/N s093272
		P/N d350-748-101 ✓	W/O 185238 ✓

240
9
228

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Aug-03-2018

CONSIGNED TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 185241

INVOICE #: 96721

**CONTRACT OR
PURCHASE ORDER # PO040630**

DESCRIPTION: CROSSTUBE

QTY 1

P/N # d350-748-101

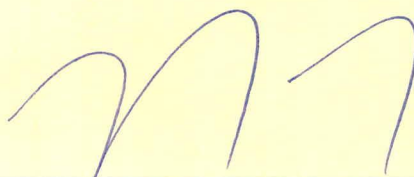
S/N # s093535

DAS
9
9-89

STRESS RELIEF BAKE HEAT CHART # 18-684. MPI IAW ASTM-E-1444. CADMIUM PLATE IAW AMS-QQ-P-416C TYPE 2 YELLOW CLASS 1. FINAL MPI IAW ASTM-E-1444. EMBRITTLE RELIEF BAKE HEAT CHART # 18-696.

CERTIFICATE: I certify that the items indicated here on have been inspected and tested and conform to all specifications and requirements detailed on the contract or purchase order.

Approved Inspector:





Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER PO040752

Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO040752
PO Date: 8/15/18
Due Date: 8/20/18
Purchase Order Revision:
Revision Date:
Ship-To Contact: Baker, Diane
Phone: dbaker@dartaero.com

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments: Rework for D119-796-241 -job# 180154 is included in price

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	174644	D350-748-101	FWD Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O TO SKYSERVICE:	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174638		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174632		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174619		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	181018		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
Sub Total:							5	0	5		\$613.64
2	174675	D350-748-201	Aft Crosstube AS350 / AS355 : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O TO SKYSERVICE:	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174649		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174672		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174648		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
	174646		1 X AUG 21 2018	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
Sub Total:							5	0	5		\$613.64
3	180759	D212-664-101	Fwd Crosstube - High : TC STC SH01-9 Issue 3, FAA STC SR01298NY 09/01/08, EASA STC EASA.IM.R.S.01304 07/03/06, DGAC MEXICO STC IA-316/2015 15/06/17 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038	Firmed	-	8/20/18	1 pcs	0 pcs	1 pcs	\$122.7272/pcs	\$122.73
			1 X AUG 21 2018								



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER PO040752

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
			LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order								
4	180560	D4885-1	End Fitting : Various STC's Issue P/O: _____ LPI Per ASTM 1417 LEVEL 2 Certificate of conformaty is required	Firmed	-	8/20/18	8 pcs	0 pcs	8 pcs	\$22.25/pcs	\$178.00
Grand Total:											\$1,528.00

Order Notes

Procurement Quality Clauses

A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retension of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 8/20/18 1:26 PM dart.baker.diane

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO37085	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO040752
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	

Task: UNSCHEDULED**Sequence: 1****Work Required:****CARRY OUT NDT ON:**

5 FWD CRUSSTUBES , P/N# D350-748-101 , J/S# 174644 , 174638 , 174632 , 174619 , 181018

5 AFT CRUSSTUBES , P/N# D350-748-201 , J/S# 174675 , 174649 , 174646 , 174672 , 174648

1 AFT CROSSTUBE , P/N# D119-796-241 , J/S# 180154 (REWORKED AREA)

1 FWD CROSSTUBE , P/N# D212-664-101 , J/S# 180759

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-16						AUG 16 2018	 DOT-APP 20 53-89
CRACK FOUND ON AFT CROSSTUBE J/S# 174648							
REMAINING ITEMS: NO CRACK FOUND							
PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715 , UV LIGHT M-20142							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	ACA/SCA Stamp 	Date:
Name: RAFIK MELIKIAN		AUG 16 2018



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D350-748-101
Job Sheet 174638



005164

Part No: D350-748-101

Job Qty: 1 ea

Part Name: FWD Crosstube AS350 / AS355



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 3/20/18

Job Tracking No:

Due Date: 7/20/18

Created By: Marie Lajeunesse

Type: SOLD

Description:

Note: DWG REV H IPP Rev:A New Issue 06-07-05 JLM IPP Rev:B Update qty of MS21042L5 06-09-12 KJ VERIFY BY:DD IPP Rev:C Rev B 07-11-15 DD IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD IPP Rev:E 08-06-24 revD as per dwg DD verified by:EC IPP Rev:F 10.08.04 added QSI010 4.3 DD verf:EC IPP REV:G ADD UNDER BEND COMMENT 12-05-28 JLM IPP REV:H 12.11.05 as per dwg D350-748-141G DD verf:JLM IPP REV:I 15.03.19 as per dwg D350-748-141revH dd verf:jlm

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	7/19/18	7/19/18	0.00	0.00	Start Up Crosstubes-1		DPL 18-07-27
110	CNC Bend Skidtubes	1 pcs	7/19/18	7/19/18	0.00	2.86	CNC Bend Skidtube		DPL 18-07-27
120	Crosstubes	1 pcs	7/19/18	7/19/18	0.00	1.94	Crosstubes-2		DPL 18-07-27
125	Outsource	1 pcs	7/19/18	7/19/18	0.00	0.00	Outsource1	P/O: CROSSY	18.07.23
126	Packaging	1 pcs	7/19/18	7/19/18	0.00	0.00	Packaging2		18.07.23
127	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC15		18.07.24
128	Crosstubes	1 pcs	7/19/18	7/19/18	0.00	1.94	Crosstubes-2		18-07-25
130	Crosstubes	1 pcs	7/19/18	7/19/18	0.00	1.94	Crosstubes-2		18-07-25
140	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC5		38
150	Outsource	1 pcs	7/19/18	7/19/18	0.00	0.00	Outsource3		18-07-27
160	Packaging	1 pcs	7/19/18	7/19/18	0.00	0.00	Packaging2		AUG 15 2018
170	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC6		18.08.16
174	Outsource	1 pcs	7/19/18	7/19/18	0.00	0.00	Outsource2		
176	Packaging	1 pcs	7/19/18	7/19/18	0.00	0.00	Packaging2		AUG 21 2018
178	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC5		38
180	SprayPaint	1 pcs	7/19/18	7/19/18	0.00	0.97	Spray Paint		18-08-23
190	QC	1 pcs	7/19/18	7/19/18	0.00	0.00	QC14		
200	Crosstubes	1 pcs	7/20/18	7/20/18	0.00	1.94	Crosstubes-2		
210	QC	1 pcs	7/20/18	7/20/18	0.00	0.00	QC5		
220	Packaging	1 pcs	7/20/18	7/20/18	0.00	0.00	Packaging1-3		
230	QC	1 pcs	7/20/18	7/20/18	0.00	0.00	QC4		
235	DC	1 pcs	7/20/18	7/20/18	0.00	0.00	DC		
240	Packaging	1 pcs	7/20/18	7/20/18	0.00	0.00	Packaging3-1		
250	QC21-FG	1 Ea	7/20/18	7/20/18	0.00	0.00	QC21		

Part Op 110 - Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT *****UNDER
Descriptions: BEND .225" PER SIDE*****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS*****

120 - ***VERIFY CROSSTUBE DIMENSIONS AS PER DWG***

125 - ISSUE P/O TO METCOR: *****Stress relief*** Heat treat crosstube as per QSI010 4.3 within 12h after bending

127 - ***MARK CUT LINES***

128 - CUT TUBE AT HEIGHT ON FAI SHEET VERF HEIGHT _____ BY QC 15 LEVEL INSPECTOR _____

Dwg D350-748-241 5-Remove all marks from tube within limits of D350-748-241

150 - Issue P/O: 040630

160 - Ensure certificate of conformity is attached

174 - ISSUE P/O TO ACCUREN: 040752 2018

AUG 17 2018

180 - 1-Prime inside and out crosstube as per QSI 005 4.2

190 - Then, Wrap in plastic bag to protect from scratches

200 - INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER 2-Install supports with Proseal 890 per D350-748-241 and QSI 015 EXP: _____ 3-Install supports clamps Using Dt8876 as per Dwg D350-748-

241, Torque to 60-80 IN-LBS.

235 - Photocopy bluefile & type labels per PPPD350-748-201 CHG003

240 - Identify and pack for shipping as per PPPD350-748-201 PPP Rev: _____

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D350-748-241TRN	Crosstube Turning Detail	1 (1 ea)	90-Start up Operation	
ALS4-1032-225	Rivnut	1 Ea (1 ea)	200-Crosstubes	
D3502-1	Support	2 Ea (2 ea)	200-Crosstubes	
D5123-7	Clamp Cushion	2 Ea (2 ea)	200-Crosstubes	
MS21920-20	Clamp	2 Ea (2 ea)	200-Crosstubes	
MS27039-1-10	Screw	1 Ea (1 ea)	200-Crosstubes	
NAS1149D0363J	Washer	1 Ea (1 ea)	200-Crosstubes	
AN4-41A	Bolt	8 Ea (8 ea)	220-Packaging	
AN4-6A	Bolt	16 Ea (16 ea)	220-Packaging	
AN5-32A	Bolt - 5019376x2	4 Ea (4 ea)	220-Packaging	
D3500-1	Saddle	4 Ea (4 ea)	220-Packaging	
D3501-1	Bushing	16 Ea (16 ea)	220-Packaging	
MS21042L4	Nut	24 Ea (24 ea)	220-Packaging	
MS21042L5	Nut	4 Ea (4 ea)	220-Packaging	
NAS1149D0463J	Washer	32 Ea (32 ea)	220-Packaging	
NAS1149D0563J	Washer	8 Ea (8 ea)	220-Packaging	

FH138045-2
 5058982
 5015692x2
 F164916x4
 5103205
 5089365
 5083541
 5089299
 5093773

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D350-748-241TRN	1	0	0
200-Crosstubes	ALS4-1032-225	1	1,149	0
	D3502-1	2	62	0
	D5123-7	2	145	0
	MS21920-20	2	108	0
	MS27039-1-10	1	313	0
	NAS1149D0363J	1	3,131	0
220-Packaging	AN4-41A	8	230	0
	AN4-6A	16	620	0
	AN5-32A	4	114	0
	D3500-1	4	101	0
	D3501-1	16	99	0
	MS21042L4	24	2,466	0
	MS21042L5	4	722	0
	NAS1149D0463J	32	3,386	0
	NAS1149D0563J	8	2,107	0

Part Specifications

Specifications could not be found.

4.0 WEIGHT AND BALANCE

The following weight and balance information is for Dart crosstube installations only. This data should be similar to the existing installation. Differences from the parts removed are the responsibility of the installer.

DART CROSSTUBE	FWD/AFT	WEIGHT	STA	MOMENT
D350-748-101	Fwd	35.2 lb	106.3 in	3742 lb-in
D350-748-103		(16.0 kg)	(2.70 m)	(43.2 kg-m)
D350-748-201	Aft	34.7 lb	162.4 in	5635 lb-in
D350-748-203		(15.7 kg)	(4.12 m)	(64.7 kg-m)

5.0 PARTS LIST

Qty -101	Qty -103	Qty -201	Qty -203	Part Number	Description
X				D350-748-101	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD
	X			D350-748-103	CROSSTUBE INSTALLATION, AS 350/355 HIGH FWD (SS)
		X		D350-748-201	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT
			X	D350-748-203	CROSSTUBE INSTALLATION, AS 350/355 HIGH AFT (SS)
1				D350-748-141	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD
	1			D350-748-143	CROSSTUBE ASSEMBLY, AS 350/355 HIGH FWD (SS)
		1		D350-748-241	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT
			1	D350-748-243	CROSSTUBE ASSEMBLY, AS 350/355 HIGH AFT (SS)
*2	*2	*2	*2	D3502-1	SUPPORT
*2	*2	*2	*2	D5123-7	CLAMP CUSHION
*1		*1		AELS-1032-225	INSERT
	*1		*1	AETC-1032	INSERT
*2	*2	*2	*2	MS21920-20	CLAMP (OR MS21920-21/-22)
*1		*1		MS27039-1-10	SCREW
	*1		*1	NAS1685-3-8	SCREW (OR MS51958-63)
*1		*1		NAS1149D0363J	WASHER (OR AN960JD10)
	*1		*1	NAS1149C0363R	WASHER (OR AN960C10)
4	4	4	4	D3500-1	SADDLE
16	16	16	16	D3501-1	BUSHING
16	16	16	16	AN4-6A	BOLT
8	8	8	8	AN4-41A	BOLT
4	4	4	4	AN5-32A	BOLT
32	32	32	32	NAS1149D0463J	WASHER (OR AN960JD416)
8	8	8	8	NAS1149D0563J	WASHER (OR AN960JD516)
24	24	24	24	MS21042L4	NUT (OR MS21042-4)
4	4	4	4	MS21042L5	NUT (OR MS21042-5)

* REFERENCE ONLY. PARTS ARE INCLUDED IN D350-748-141/-143/-241/-243 ASSEMBLIES ABOVE

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Date: 15.02.25

